RESTRICTED CIRCULATION

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AGRICULTURAL MEMORANDUM No 629

DAY AND NIGHT VALUES OF ACCUMULATED TEMPERATURE BELOW VARIOUS BASES FOR SELECTED SITES - D FORSDYKE

MAFF Bulletin No 115, Commercial Glasshouses, gives in an appendix tables of estimated average monthly degree days below a series of base temperatures but there is no provision for allocating the degree days between day and night when different base temperatures will generally be used.

Tables are presented here of average monthly degree days for 6 different places in England and Wales which should be representative of 6 of the glasshouse areas for which figures were given in the Bulletin. The stations chosen were those for which hourly values of temperature and wind speed are available in a computer data bank for various periods. An existing data sorting programme was used to produce printouts of frequency tables of temperature and wind speed. The temperature interval used was 1°C and the wind speeds were divided into 10 ranges. Two tables were produced for each month, one for daytime values and the other for those at night. The data were then processed using a desk computer to obtain the average monthly values of accumulated temperature in degree days (°C) below 6 base temperatures, from 22°C to 7°C. Intermediate values can be obtained by inter polation from the tables if required.

It is well known that the rate of heat loss from a glasshouse depends on the wind speed as well as the temperature lift. Since the frequency tables are for temperature and wind speed it is possible, using Morris's formula for the 'U' value, to calculate the average monthly heat loss by day and by night for different base temperatures and this is now being done.

REFERENCES

MAFF Bulletin No 115 (1964) - Commercial Glasshouses

Morris L G (1961) - The heating and ventilation of Greenhouses - "Atti del Convegne Internazionale per haddifesa delle colture o degli allevevamenti dalle avversita atmosferische - Torino 22-23 Ottobre 1961".

Any comments or suggestions on this paper should be referred to the author.

Meteorological Office
ADAS
Westbury-on-Trym
Bristol

July 1974

MONTH	DAYLIGHT HOURS GMT	LONDON AIRPORT 1949-1971											
		BASE TEMPERATURE °C											
		22		19		16		13		10		7	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
JANUARY	09-16	177	381	146	319	115	257	84	195	54	134	29	79
FEBRUARY	08-17	198	306	163	256	127	207	92	158	59	109	31	64
MARCH	07-18	227	266	180	220	134	173	89	127	50	81	22	42
APRIL	06-19	207	188	155	151	105	113	59	76	26	42	8	16
MAY	05-20	176	124	118	93	67	62	28	34	8	12	1	2
JUNE	04-20	121	75	69	50	31	26	10	8	2	2	0	0
JULY	05-20	86	74	41	44	13	18	2	4	0	0	0	0
AUGUST	06-19	78	96	36	58	11	25	2	6	0	0	0	0
SEPTEMBER	06-18	100	123	57	82	24	44	8	16	2	4	0	0
OCTOBER	07-17	134	199	92	148	53	99	24	54	9	23	3	7
NOVEMBER	08-16	157	292	124	236	90	180	57	124	29	72	11	32
DECEMBER	09-16	169	362	138	300	107	238	76	176	47	116	23	65

MONTH	DAYLIGHT HOURS GMT	THORNEY ISLAND 1959-1971											
		BASE TEMPERATURE °C											
		22		19		16		13		10		7	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
JANUARY	09-16	175	375	145	313	113	251	83	189	52	127	26	72
FEBRUARY	08-17	196	300	161	251	125	201	90	152	55	103	27	58
MARCH	07-18	231	265	184	218	138	172	92	125	49	79	20	38
APRIL	06-19	216	187	163	150	111	112	62	75	24	39	7	14
MAY	05-20	190	95	129	64	73	34	28	11	6	2	1	0
JUNE	04-20	135	80	77	54	31	28	8	8	2	2	0	0
JULY	05-20	99	79	46	48	12	19	2	4	0	0	0	0
AUGUST	06-19	85	97	38	59	9	23	2	5	0	1	0	0
SEPTEMBER	06-18	98	122	53	81	19	41	5	14	1	3	0	0
OCTOBER	07-17	123	185	81	135	43	85	16	42	5	16	1	4
NOVEMBER	08-16	150	278	117	222	83	166	50	110	23	61	8	27
DECEMBER	09-16	166	359	135	297	104	235	73	173	44	113	21	63

MONTH	DAYLIGHT HOURS GMT	PLYMOUTH (MOUNTBATTEN) 1949-1971											
		BASE TEMPERATURE °C											
		22		19		16		13		10		7	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
JANUARY	09-16	159	336	128	274	97	212	66	150	36	90	16	45
FEBRUARY	08-17	185	279	149	229	114	180	79	131	45	82	20	42
MARCH	07-18	221	247	175	200	128	154	82	107	40	61	14	26
APRIL	06-19	215	179	162	142	110	104	60	67	21	31	4	8
MAY	05-20	201	124	140	93	81	62	31	32	6	9	1	1
JUNE	04-20	151	80	91	54	38	28	7	7	1	1	0	0
JULY	05-20	114	80	58	49	15	20	2	3	0	0	0	0
AUGUST	06-19	99	99	49	60	11	24	1	5	0	1	0	0
SEPTEMBER	06-18	108	118	61	77	21	37	4	11	1	2	0	0
OCTOBER	07-17	129	179	86	129	45	79	15	35	4	12	1	3
NOVEMBER	08-16	142	257	108	201	74	145	41	89	17	43	4	13
DECEMBER	09-16	148	315	117	253	86	191	55	129	28	72	11	34

MONTH	DAYLIGHT HOURS GMT	CARDIFF (RHOOSE) 1957-1971											
		BASE TEMPERATURE °C											
		22		19		16		13		10		7	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
JANUARY	09-16	177	374	146	312	115	250	84	188	53	127	27	71
FEBRUARY	08-17	199	300	164	251	129	201	94	152	59	103	29	58
MARCH	07-18	237	268	191	221	144	175	98	128	54	82	22	41
APRIL	06-19	228	192	175	155	123	117	73	80	31	43	9	16
MAY	05-20	207	132	145	101	87	70	37	39	8	14	1	3
JUNE	04-20	151	84	92	58	40	33	10	11	2	2	0	0
JULY	05-20	119	87	62	56	18	27	3	7	0	1	0	0
AUGUST	06-19	104	107	53	68	14	31	2	8	0	1	0	0
SEPTEMBER	06-18	115	128	68	86	28	46	7	16	1	4	0	0
OCTOBER	07-17	138	191	95	141	54	90	20	44	5	17	1	5
NOVEMBER	08-16	158	287	124	231	90	174	57	118	27	67	9	29
DECEMBER	09-16	169	358	138	296	107	234	76	172	46	111	22	68

MONTH	DAYLIGHT HOURS GMT	BIRMINGHAM (ELMDON) 1950-1971											
		BASE TEMPERATURE °C											
		22		19		16		13		10		7	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
JANUARY	09-16	185	395	155	333	124	272	93	210	62	148	35	92
FEBRUARY	08-17	210	320	175	271	139	222	104	172	70	123	40	77
MARCH	07-18	243	281	196	234	150	188	104	141	62	95	31	54
APRIL	06-19	229	203	177	166	125	128	76	91	37	55	13	26
MAY	05-20	204	139	144	108	88	77	43	47	14	21	3	6
JUNE	04-20	149	89	92	62	45	37	16	16	4	4	1	1
JULY	05-20	113	91	60	60	22	31	4	9	1	1	0	0
AUGUST	06-19	102	116	54	77	19	41	4	13	1	2	0	0
SEPTEMBER	06-18	125	145	77	104	37	63	13	29	3	9	1	2
OCTOBER	07-17	152	220	110	170	69	119	34	72	13	34	4	13
NOVEMBER	08-16	169	308	135	252	101	195	68	139	38	86	15	42
DECEMBER	09-16	178	377	147	315	116	253	85	191	55	130	29	77

MONTH	DAYLIGHT HOURS GMT	MANCHESTER (RINGWAY) 1949-1971											
		BASE TEMPERATURE °C											
		22		19		16		13		10		7	
		DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
JANUARY	09-16	184	387	153	325	122	263	91	201	60	140	33	83
FEBRUARY	08-17	206	313	171	264	136	215	100	165	66	116	36	71
MARCH	07-18	239	273	193	227	146	181	101	134	59	88	27	48
APRIL	06-19	226	196	174	159	122	121	73	84	35	48	11	20
MAY	05-20	200	132	140	101	85	71	39	41	12	17	2	4
JUNE	04-20	148	86	92	60	44	34	14	13	3	3	0	0
JULY	05-20	120	88	66	57	24	28	4	8	0	1	0	0
AUGUST	06-19	105	111	57	73	20	37	3	11	0	1	0	0
SEPTEMBER	06-18	122	136	76	95	36	55	11	22	2	5	0	1
OCTOBER	07-17	149	209	107	159	66	109	31	62	11	27	3	8
NOVEMBER	08-16	168	302	134	246	101	190	67	134	36	80	14	37
DECEMBER	09-16	176	370	145	308	114	246	83	184	53	123	27	69